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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER
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KASTURE, DNYANESH G

ART UNIT	PAPER NUMBER
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3746

NOTIFICATION DATE	DELIVERY MODE
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11/18/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/553,056	<b>Applicant(s)</b> CHUNG ET AL.	
	<b>Examiner</b> DNYANESH KASTURE	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. Applicant's response on September 25, 2008 states that the examiner has not provided the applicants with an initialed copy of Form PTO-SB08, that applicant claims was filed with the Information Disclosure Statement on December 5, 2006 however, PTO records do not reflect any such forms filed on that date.

### ***Specification***

2. The previously made objections to the specification are hereby withdrawn in view of amendments submitted on September 25, 2008.

### ***Claim Rejections - 35 USC § 112***

3. The previously made 112 2<sup>nd</sup> paragraph rejections of Claims 7-14 are hereby withdrawn in view of amendments submitted on September 25, 2008.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 – 6, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Patent 6,435,842 B2) in view of Campbel et al (WO Publication WO 0129444 A1) and further in view of Choi et al (US PG Pub 20020057973 A1)

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Figure 2A  
of Song

FIG. 2A  
CONVENTIONAL ART

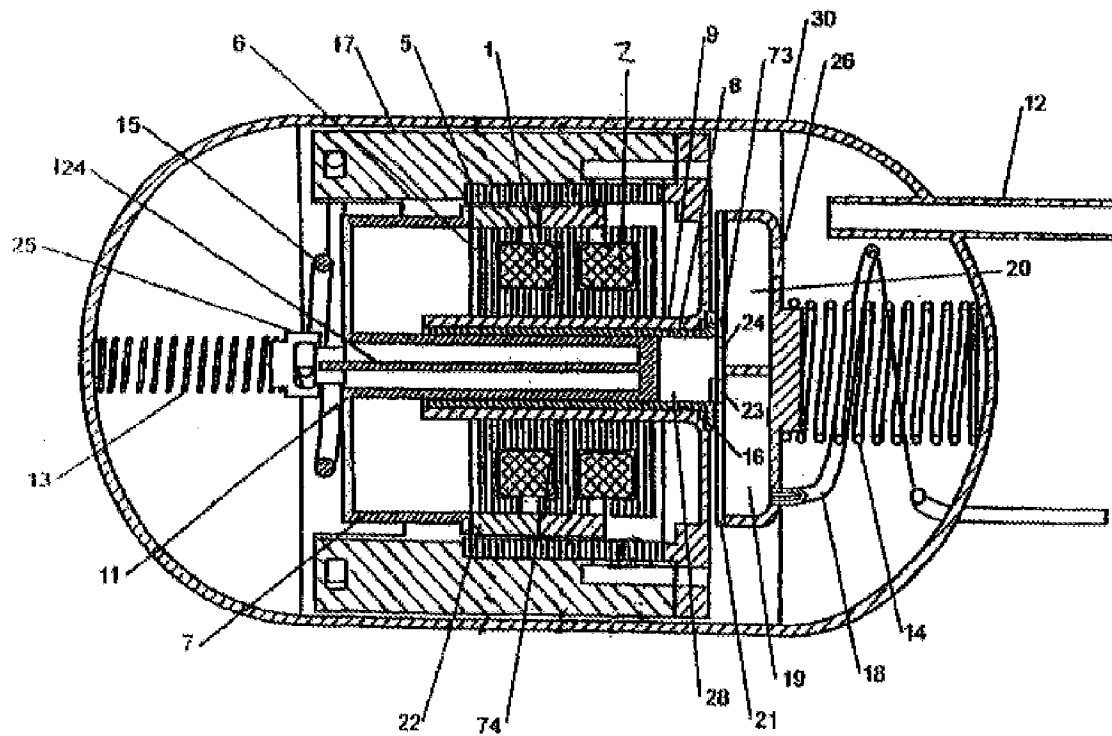
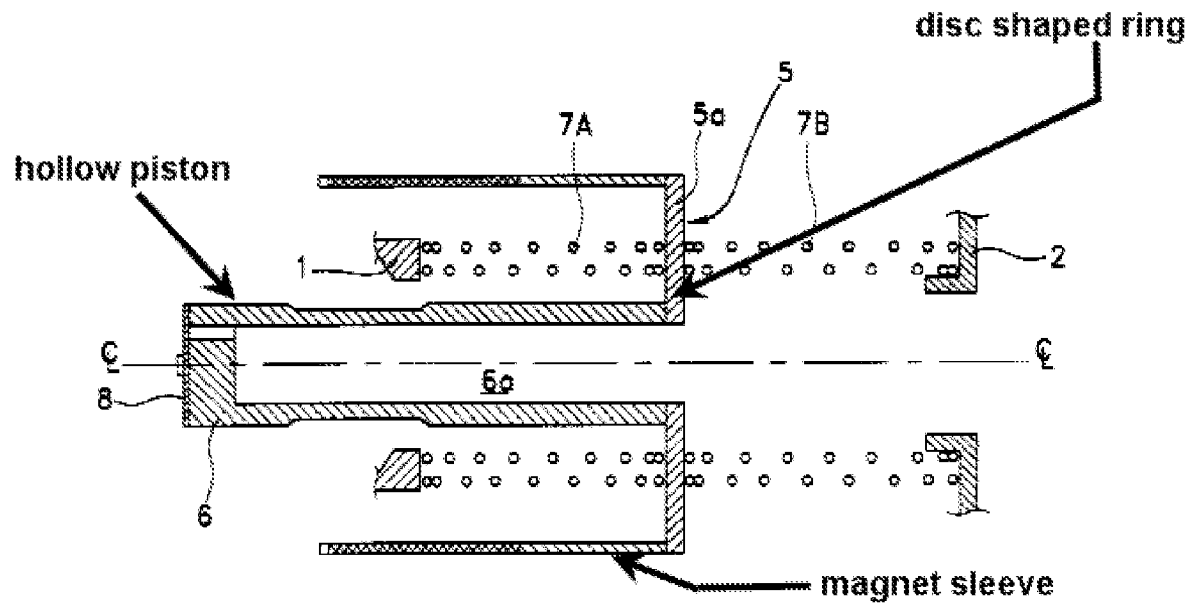
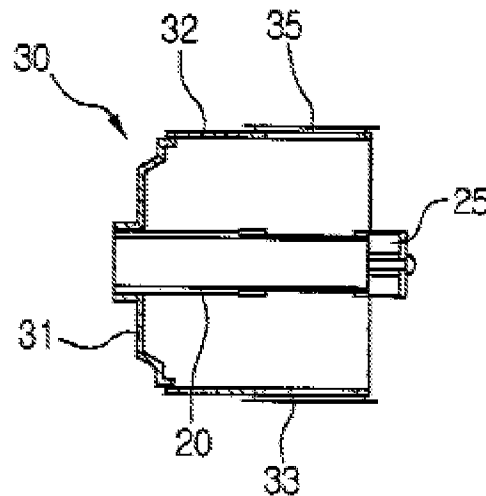


Figure 1 of  
Campbel et al

FIGURE 1

**FIG.2**

**Figure 2 of Choi et al**



6. In Re claim 1, with reference to Figure 2A depicted above, Song discloses a piston assembly (Column 1, Line 35) comprising:
- a hollow cylinder shaped magnet sleeve (annotated) having a magnet (at the bottom of the magnet sleeve – part of "magnet assembly 5")
  - a hollow cylinder shaped piston (annotated), inserted into a hollow space of the magnet sleeve as depicted
  - a hollow disc shaped ring (5a) fixed to the piston
  - the magnet sleeve and piston are coupled together as they are integrated with the hollow disc shaped ring
  - wherein an edge side circumferential surface of the magnet sleeve and an inner peripheral surface of the ring contact each other, since the vertical section (sleeve) is

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separate from the horizontal section (ring) as denoted by the conventional cross section lines (see region of contact)

7. However, Song does not explicitly disclose that the magnet is bonded on the external circumferential surface, and that the disc is fixed to the piston by shrink fitting process, and welded to the magnetic sleeve which is made of the same material as the ring.

8. Nevertheless, with reference to Figure 1, Campbel et al depicts that the ring and sleeve are one piece (7) suggesting that they are made of the same material. Further, the magnets (22) are bonded to each other and to the sleeve (Detailed Description Section) on the external circumferential surface as depicted.

9. It would have been obvious to a person having ordinary skill in the art at the time of the invention to form the sleeve and ring of Song to be of the same material as suggested by Campbel et al as a suitable design choice for the purpose of saving the cost of having two different materials. Note that it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art (MPEP 2144.04 (V-C)) therefore forming the piston, ring and sleeve of Campbel et al as three different elements involves only routine skill in the art. It would also have been obvious to a person having ordinary skill in the art at the time of the invention to bond the magnets of Song on the external circumferential surface of the sleeve as depicted by Campbel et al as a suitable design choice that saves cost of machining the sleeve if the magnets were mounted inside.

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10. Song modified by Campbel et al disclose all the claimed limitations except for, the ring is fitted to the piston by shrink fitting and the ring is fitted to the sleeve by welding.

11. Nevertheless, with reference to Figure 2 depicted above, Choi et al discloses a piston assembly (Paragraph [0026]) comprising:

- a hollow cylinder shaped magnet sleeve (32) having a magnet (33) bonded together by magnet cover (35) on the external circumferential surface
- a hollow cylinder shaped piston (20), inserted into a hollow space of the magnet sleeve as depicted
- a hollow disc shaped ring (31) fixed to the piston (20) by welding process, and fixed to magnet sleeve (32) also by welding process. Paragraph [0013], Lines 4-6 state: “For example, the piston 20 and linking member 31 are welded together, as are the linking member 31 and the magnet holder 32”. The magnet sleeve and piston are therefore coupled to each other.

12. However, Choi et al does not disclose that a shrink fitting process is used to fix the piston to the ring. Nevertheless, Choi et al discloses that there are other methods for forceful coupling between parts as stated in column 2, line 1: “forceful coupling methods, such as force fit, welding, etc., to secure the parts together”. In accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the piston to the ring is not germane to the issue of patentability of

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the piston assembly itself. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the piston assembly comprising the ring fixed to the piston, does not depend on its method of production.

13. It would have been obvious to a person having ordinary skill in the art at the time of the invention to join the ring, sleeve and piston of Song modified by Campbel so that the ring is fitted to the piston by shrink fitting and the ring is fitted to the sleeve by welding as taught by Choi et al since forming a detailed part in various elements joint together would save machining costs.

14. In Re claims 2-6, Song modified by Campbel et al and Choi et al as applied to claim 1 discloses all the claimed limitations. In accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the ring to the piston or magnet sleeve is not germane to the issue of patentability of the piston assembly itself. Therefore this limitation has not been given patentable weight. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the piston assembly comprising the ring fixed to the piston and magnet sleeve, does not depend on its method of production.



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15. In Re claim 15, Campbel et al discloses a displaceable rod (124) extending through the hollow cylinder-shaped piston.

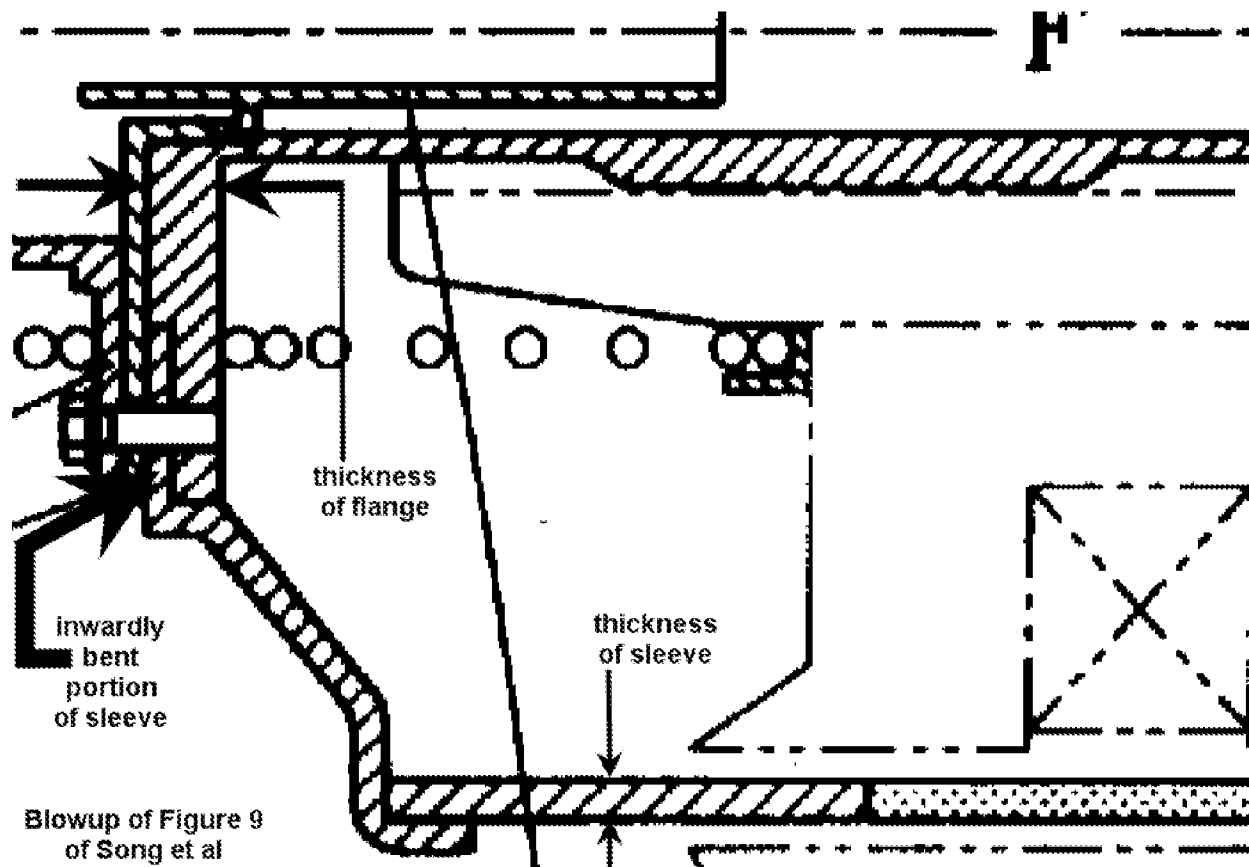
16. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US PG Pub 20020057973 A1) in view of Song et al (US Patent 6,174,141 B1) and further in view of Seeds (US Patent 6,334,568 B1) as extrinsically evidenced by Poupitch (US Patent 3,488,466 A)

17. In Re claim 7, with reference to Figure 2, Choi et al discloses a piston assembly (Paragraph [0026]) comprising:

- a hollow cylinder shaped magnet sleeve (32) and a magnet (33) bonded together by magnet cover (35) on the external circumferential surface
- a hollow cylinder shaped piston (20), insertedly equipped in the hollow space of the magnet sleeve as depicted

18. However, Choi et al does not disclose a bent portion, a flange in the piston with a fixing member inserting hole, a fixing member fusion fixed to the magnetic sleeve on its surface by applied current and functioning as a filler metal to fix the bent portion of the magnetic sleeve and the flange part of the piston together, the flange and sleeve being made of different materials and the flange part being thicker than the bent portion as set forth in the claim.

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19. Nevertheless, with reference to blowup of Figure 9 depicted above, Song et al discloses a sleeve (7, 8) having an inwardly bent portion as depicted at one end of a hollow space thereof, a flange as depicted having a thickness that is greater than the thickness of the sleeve (see annotations), a fixing member inserting hole formed in the flange in the region of the inwardly bent portion of the sleeve, and a fixing member which appears to be a bolt/screw.

20. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the sleeve of Choi et al so it has an inwardly bent portion as taught by Song et al, and to modify the flange (31) of Choi et al so it has a fixing member inserting hole, and is greater than the thickness of the sleeve as taught by

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Song et al and to fix the bent portion of the magnet sleeve and flange together using a fixing member as taught by Song et al as an alternate design choice for assembly that saves the cost of welding the sleeve to the flange (which is the teaching of Choi et al).

21. Choi et al modified by Song et al discloses all the claimed limitations except for a fixing member fusion fixed to the magnetic sleeve on its surface by applied current and functioning as a filler metal to fix the bent portion of the magnetic sleeve and the flange part of the piston together, the flange and sleeve being made of different materials.

22. Nevertheless, it is known in the art that in conventional piston assemblies, the flange of the piston and the magnetic sleeve are made of different materials, as recognized by applicant on Page 11 of the specification, Lines 1-2. It would therefore only involve routine skill to incorporate this design aspect into the apparatus of Choi et al modified by Song et al.

23. Further, Seeds suggests in Figure 3 how a fixing member (116) can fix the flange (114) to the bent portion of the sleeve (12) by friction welding (Column 4, Lines 6-8). The fixing portion therefore contacts the outer surface of the bent portion at (17).

24. It would have been obvious to a person having ordinary skill in the art at the time of the invention to fix the flange and bent portion of the sleeve of Choi et al modified by Song et al by friction welding a fixing member to the outer surface of the bent portion of the sleeve as taught by Seeds, the fixing member being inserted through the fixing – member-inserting-hole as depicted by Seeds for the purpose of permanently fixing the flange and sleeve as an alternate design choice to the bolt of Song et al, since the bolt could come loose.

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25. Choi et al modified by Song et al and Seeds discloses all the claimed limitations except for the fixing member being fusion fixed to the magnetic sleeve by an applied current and functioning as a filler metal, although there is suggestion that the fixing member of Seeds is fixed by fusion because the friction welding process causes the surface part of the fixing member to merge / fill with the surface material of the bent portion of the sleeve.

26. Nevertheless, this aspect is known in the art as extrinsically evidenced by Poupitch where Figure 5 discloses how the tip of the fixing member (24) acts as a filler metal (Column 3, Line 5 states “metallic welding rivets or fasteners 24”) that is fused to the bent portion of the sleeve (26) thereby fixing it to the flange (20). Further, Poupitch discloses electrically coupling conductors (74), terminals (72), electrodes (32) and a welding “circuit” Column 4, Lines 47-50 that supplies current to form the weld. Note that in accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the flange to the bent portion of the sleeve is not germane to the issue of patentability of the piston assembly itself. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the assembled flange and bent portion of the sleeve, does not depend on its method of production.

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27. In Re claim 8, in order for the welding process of Poupitch to work, the fixing member would have to be made of material which is fusable by application of electric current, since it is the electricity that makes the weld possible.

28. In Re claim 9, Seeds depicts in Figure 3, that the stud (116) is rivet shaped.

29. In re claim 10, in accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the bent portion of the magnet sleeve, the flange and the fixing member is not germane to the issue of patentability of the piston assembly itself. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the piston assembly comprising the magnet sleeve, flange and the fixing member, does not depend on its method of production (electrical resistance welding method). Note that Henry et al, on Page 53, under the header "Spot, Seam, and Projection-Welding", line 1 discloses "...resistance welding processes..", the resistance welding process is therefore known in the art.

30. Claims 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US PG Pub 20020057973 A1) in view of Song et al (US Patent 6,174,141 B1) and

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in view of Campbel et al (WO Publication WO 0129444 A1) and further in view of Seeds (US Patent 6,334,568 B1) as extrinsically evidenced by Poupitch (US Patent 3,488,466 A)

31. In Re claim 16, Choi et al, Song et al, Seeds and Poupitch as applied to claim 7 disclose all the claimed limitations except for a displaceable rod extending through the hollow cylinder-shaped piston.

32. Nevertheless, Campbel et al discloses a displaceable rod (124) extending through the hollow cylinder-shaped piston.

33. It would have been obvious to a person having ordinary skill in the art at the time of the invention to attach a displaceable rod as taught by Campbel et al into the hollow cylinder-shaped piston of Song et al to transfer spring forces directly to the piston end in order to reduce the delay in spring response.

34. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US PG Pub 20020057973 A1) in view of Song et al (US Patent 6,174,141 B1) and further in view of Gapp et al (US Patent 3,848,389 A)

35. In Re claim 11, Choi et al and Song et al as applied to claim 7 discloses all the claimed limitations including the bent portion also having a fixing member inserting hole as depicted by Song et al because the bolt passes through both the flange and the bent portion in order to secure the two together (the bolt can be seen in the blow up depicted

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above of Figure 9 of Song et al in the region of the bent portion), except that Choi et al and Song et al do not disclose that the fixing member is fusion fixed to the magnet sleeve by an applied electric current and functioning as a filler metal to fix the bent portion and the flange together.

36. Nevertheless, with reference to Figure 2, Gapp et al discloses how a fixing member (3, 4, 5, 6) has material (5) that is capable of being fused/deformed in the direction of the bent portion of the sleeve (2), thereby acting as a filler material to fasten the bent portion of the sleeve (2) to the flange (1).

37. It would have been obvious to a person having ordinary skill in the art at the time of the invention to substitute the bolt of Song et al with the fixing member as taught by Gapp et al to fasten the bent portion of the sleeve to the flange for the purpose of permanently fixing the flange and sleeve as an alternate design choice to the bolt of Song et al, since the bolt could come loose. With regards to the limitation "by an applied current", in accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the flange to the bent portion of the sleeve is not germane to the issue of patentability of the piston assembly itself. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the assembled flange and bent portion of the sleeve, does not depend on its method of production "by an applied current".

38. In Re claim 12, in order for the rivet forming process of Gapp et al to work, the fixing member would have to be made of material which is fusable by application of rivet driving force, or by other means as suggested by the phrase “readily formable material” in Column 1, Line 32 implying that it is deformable when electric current is applied.

39. In Re claim 13, Gapp et al depicts in Figure 2, that the stud (3) is rivet shaped.

40. In re claim 14, in accordance with MPEP 2113, the method of forming a device is not germane to the issue of patentability of the device itself. In this case, the claim is to a piston assembly which is a device/apparatus, and the method of forming the piston assembly including the technique used to fix the bent portion of the magnet sleeve, the flange and the fixing member is not germane to the issue of patentability of the piston assembly itself. Please note that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product, i.e. the piston assembly comprising the magnet sleeve, flange and the fixing member, does not depend on its method of production (electrical resistance welding method). Note that Henry et al, on Page 53, under the header “Spot, Seam, and Projection-Welding”, line 1 discloses “..resistance welding processes..”, the resistance welding process is therefore known in the art.



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41. Claims 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US PG Pub 20020057973 A1) in view of Song et al (US Patent 6,174,141 B1) and in view of Campbel et al (WO Publication WO 0129444 A1) and further in view of Gapp et al (US Patent 3,848,389 A)

42. In Re claim 17, Choi et al, Song et al, and Gapp et al as applied to claim 11 disclose all the claimed limitations except for a displaceable rod extending through the hollow cylinder-shaped piston.

43. Nevertheless, Campbel et al discloses a displaceable rod (124) extending through the hollow cylinder-shaped piston.

44. It would have been obvious to a person having ordinary skill in the art at the time of the invention to attach a displaceable rod as taught by Campbel et al into the hollow cylinder-shaped piston of Song et al to transfer spring forces directly to the piston end in order to reduce the delay in spring response.

### ***Response to Arguments***

45. Applicant's arguments with respect to all the claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

46. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Roke et al (US Patent 6,966,761 B1) is in the same patent family and equivalent of Campbel et al (WO Publication WO 0129444 A1) cited earlier in this office action. Kwon et al (US Patent 6,838,789 B2) discloses how a support frame (2) is welded to an inner stator. Kato et al (US Patent 6,381,842 B2) discloses in Figures 5A and 5B how a cylinder head is welded to a closing portion by electron beam welding.

47. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is

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(571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272 - 7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746

DGK